

Remarks

Claims 21-28 are pending upon entry of the foregoing amendments.

Amendments to the Claims

Claims 1-20 have been cancelled and rewritten as new claims 21-28, in order to clarify the claimed devices. Claims 13-18 are canceled without prejudice as being drawn to a non-elected invention.

Support for the new claims is found in the original claims and in the description, particularly in paragraphs 0036 to 0040, 0027, 0031, 0035 (numbered as in the published application) and in FIGS. 2 and 3.

Rejections Under 35 U.S.C. § 112

Claims 1-12, 19, and 20 were rejected under 35 U.S.C. § 112, first paragraph, as lacking enablement. Claims 1-12, 19, and 20 were rejected under 35 U.S.C. § 112, second paragraph, as indefinite. The rejections are respectfully traversed.

Applicants' Claimed Devices Are Enabled By the Specification.

A patent application description is presumed to be adequate, unless or until sufficient evidence or reasoning to the contrary has been presented by the examiner to rebut the presumption. In re Marzocchi, 439 F.2d 220, 224 (C.C.P.A. 1971); M.P.E.P. § 2163. No evidence has been provided to establish that the claimed devices have not been adequately described. The test of enablement is whether one skilled in the art could make and use the claimed invention from the disclosure in the patent coupled with information known in the art without undue experimentation. One of skill in the art can readily ascertain from Applicants' disclosure sufficient information to make and use the claimed fuel cell flow plates and fuel cells

without undue experimentation. Coupled with information well known to those skilled in the art, paragraphs 0036 through 0040 of Applicants' specification sufficiently describe how the skilled artisan can select suitable dimensions for the flow field paths.

Applicants teach that "the dimensions of the flow path should be selected so that the total resistance of the flow path enables a molar flow rate of reactant, m , of $m = iAs/(nF)$ (EQ.1) where i is the desired current density, n is the moles of electrons produced per mole of reactant consumed, F is Faraday's constant, and s is the fuel utilization." Paragraph 0036. Flow resistance is readily calculable by one skilled in the art using basic fluid mechanics knowledge. It therefore would not require undue experimentation for the skilled artisan to choose a particular combination of channel width, depth, and length to provide a desired current density, at particular molar flow rates and fuel utilizations for a given service area. An iterative process could be used without undue experimentation.

Applicants' Claims Are Clear and Definite.

M.P.E.P. § 2173.02 states that the essential inquiry pertaining the requirement for definiteness under 35 U.S.C. § 112 is "whether the claims set out and circumscribe a particular subject matter with a reasonable degree of clarity and particularity" and that "definiteness of claim language must be analyzed, not in a vacuum, but in light of ... the claim interpretation that would be given by one possessing the ordinary level of skill in the pertinent art at the time the invention was made." Applicants' claims as amended define the claimed devices with sufficient and reasonable clarity and particularity. The amendments to the claims are believed to possess correct antecedent basis for all terms and to moot each and every basis relied upon by the Examiner to support the prior rejection.

Rejections Under 35 U.S.C. § 102

Claims 1-12, 19, and 20 were rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent 4,292,379 to Kothmann (hereinafter “Kothmann”). Claims 1-12, 19, and 20 were rejected under 35 U.S.C. § 102(e) as anticipated by U.S. Patent Application Publication No. 2004/0151970 to Ferguson (hereinafter “Ferguson”). Claims 11-12, 19, and 20 were rejected under 35 U.S.C. § 102(e) as anticipated by U.S. Patent 6,780,536 to Debe et al. (hereinafter “Debe”). The rejections are respectfully traversed.

The Claimed Devices

Applicants’ claims are directed to fuel cells having flow paths designed to provide substantially uniform current density in the fuel cell, which may provide advantages of higher generated voltage and higher efficiency of the fuel cell. Specifically, the fuel cell includes a flow field plate that has at least two flow field paths, which respectively service at least two electrochemical surface areas of the flow field plate. Each of the flow field paths has a width, depth, and length dimensioned to provide a molar flow rate of a reactant through the flow field path such that the at least two electrochemical surface areas of the at least one flow field plate have a current density equal to one another.

Kothmann

Kothmann discloses a fuel cell having fuel and oxidant channels which provide more fuel and oxidant nearest their respective inlet channels. Kothmann does not disclose or suggest a flow field plate which has at least two flow field paths, which respectively service at least two electrochemical surface areas of the at least one flow field plate, *wherein each of the at least two flow field paths is dimensioned to provide a molar flow rate of a reactant through said flow field*

path such that the at least two electrochemical surface areas of the at least one flow field plate have a current density equal to one another.

Ferguson

Ferguson discloses a flow field having channels where the active portion of the article comprises a first subsection having cross-sectional profiles different from the channels within a second section. However, Ferguson fails to disclose or suggest a flow field plate which has at least two flow field paths, which respectively service at least two electrochemical surface areas of the at least one flow field plate, *wherein each of the at least two flow field paths is dimensioned to provide a molar flow rate of a reactant through said flow field path such that the at least two electrochemical surface areas of the at least one flow field plate have a current density equal to one another.*

Debe

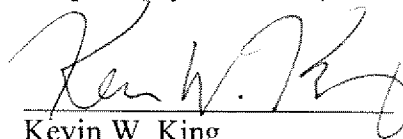
Debe discloses a fluid distribution assembly having a flow field device and a fluid transport layer disposed between the flow field device and a target area. Debe, however, does not remotely disclose or suggest a flow field plate which has at least two flow field paths, which respectively service at least two electrochemical surface areas of the at least one flow field plate, *wherein each of the at least two flow field paths is dimensioned to provide a molar flow rate of a reactant through said flow field path such that the at least two electrochemical surface areas of the at least one flow field plate have a current density equal to one another.*

Conclusions

The claims as amended are clear and definite, enabled, and patentable over the prior art of record. Prompt allowance of each of the pending claims 21-28 is therefore respectfully solicited.

The undersigned kindly invites the Examiner to contact him by telephone (404.853.8068) if any outstanding issues can be resolved by conference or examiner's amendment.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read "Kevin W. King", is written over a horizontal line.

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